

1. A communication system comprising:

a plurality of optical fibers;

a plurality of Point of Presence (POP) nodes coupled to the optical fibers and configured to exchange communications with external systems; and

5 a plurality of switch nodes coupled to the optical fibers and configured to exchange the communications with the POP nodes and to exchange the communications with one another, and wherein in the event of a fault, the POP nodes and the switch nodes are configured to implement ring protection for the communications between the POP nodes and the switch nodes and to implement mesh protection for the communications
10 between the switch nodes.

2. The communication system of claim 1 wherein the POP nodes and the switch nodes are configured to implement the ring protection by re-routing an affected portion of the communications over a protect path or line around an optical ring in the opposite

15 direction of a work path or line, and wherein the switch nodes are configured to implement the mesh protection by re-routing the affected portion of the communications around the fault through an optical mesh.

3. The communication system of claim 1 wherein the communication system comprises a
20 long distance network and the external systems include a local telephone network.

4. The communication system of claim 1 wherein the switch nodes are configured to process telephone numbers to route telephone calls over the optical fibers.

5. The communication system of claim 1 wherein the POP nodes exchange the communications over stacked optical rings within the optical fibers.

6. The communication system of claim 1 wherein the mesh protection is based on links
5 that can be connected to form a protect connection with latency that is low enough to avoid echo cancellation.

7. The communication system of claim 1 wherein the mesh protection is based on links
that can be connected to form a protect connection that maintains a class-of-service of a
10 faulty link.

8. A communication system comprising:

a plurality of optical fibers;

a plurality of two degree nodes coupled to the optical fibers and configured to exchange communications; and

5 a plurality higher degree nodes coupled to the optical fibers and configured to exchange the communications, and wherein in the event of a fault, the two degree nodes and higher degree nodes are configured to implement ring protection for the communications with the two degree nodes and to implement mesh protection for the communications between the higher degree nodes.

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9. The communication system of claim 8 wherein the two degree nodes are configured to implement the ring protection by re-routing affected portions of the communications over a protect path or line around an optical ring in the opposite direction of a work path or line, and wherein the higher degree nodes are configured to implement the mesh
15 protection by re-routing the affected portion of the communications around the fault through an optical mesh.

10. The communication system of claim 8 wherein the two degree nodes exchange the communications over stacked optical rings within the optical fibers.

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11. The communication system of claim 8 wherein the mesh protection is based on links that can be connected to form a protect connection with latency that is low enough to avoid echo cancellation.

12. The communication system of claim 8 wherein the mesh protection is based on links that can be connected to form a protect connection that maintains a class-of-service of a faulty link.

5 13. The communication system of claim 8 wherein the mesh protection uses links pre-planned for the fault.

14. The communication system of claim 8 wherein the mesh protection uses links selected after the fault.

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15. The communication system of claim 8 wherein additional communications between the higher degree nodes is ring protected.

16. A communication system comprising:

a plurality of optical fibers;

a plurality of nodes coupled to the optical fibers and configured to exchange communications, and in the event of a fault, to implement ring protection for a first set of the communications and to implement mesh protection for a second set of the communications, wherein a communication system customer selects the first set of the communications for the ring protection and selects the second set of the communications for the mesh protection.

17. The communication system of claim 16 wherein the nodes are configured to implement the ring protection by re-routing an affected portion of the communications over a protect path or line around an optical ring in the opposite direction of a work path or line, and wherein the nodes are configured to implement the mesh protection by re-routing the affected portion of the communications around the fault through an optical mesh.

18. The communication system of claim 16 wherein the ring protection is more expensive for the communication system customer than the mesh protection.

19. The communication system of claim 16 wherein the mesh protection uses links pre-planned for the fault for a first portion of the second set of the communications and uses links selected after the fault for a second portion of the second set of the communications.

20. The communication system of claim 19 the mesh protection using the pre-planned links is more expensive for the communication system customer than the mesh protection using links selected after the fault.